

**Title: Fractions and Exponents**

**Objective:**

To discover some new properties of exponents and to practice with fractions.

**IN:**

Assume the area of your desktop is equals 1. Your math book covers  $\frac{1}{4}$  of your desktop, your calculator covers  $\frac{1}{16}$  of your desktop and your scrap paper covers  $\frac{1}{32}$  of your desktop. What total area is covered by these objects? Write an addition expression and then give your answer as a single fraction in lowest terms.



Write each multiplication expression in exponent form.

1.  $5(5)(5)(5)$
2.  $15 \times 15 \times 15$
3.  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

Rewrite each expression as repeated multiplication.

4.  $25^2$
5.  $3^4$
6.  $5^5$



Write each number as POWER with an exponent not equal to 1!

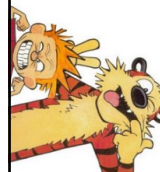
For example  $125 = 5^3$

7.  $27 =$

8.  $32 =$

9.  $1 =$

10.  $\frac{1}{4}$



Exponents Exploration  
Prove your own properties!

Name: \_\_\_\_\_ Period: \_\_\_\_\_

Power	Answer	Power	Answer	Power	Answer
$1^5$		$10^5$		$\frac{1}{2}^5$	
$1^4$		$10^4$		$\frac{1}{2}^4$	
$1^3$		$10^3$		$\frac{1}{2}^3$	
$1^2$		$10^2$		$\frac{1}{2}^2$	
$1^1$		$10^1$		$\frac{1}{2}^1$	

- Write your own "conjecture" about any number  $n$  raised to the  $1^{\text{st}}$  power. Test your conjecture.

Utilizing the pattern that you found above, continue the tables below:

Power	Answer	Power	Answer	Power	Answer
$1^0$		$10^0$		$\frac{1}{2}^0$	

- What conjecture can you make about raising a number to the zero power?
- Describe WHY raising a number to the power of zero = 1.

Properties of exponents: Expand first. Then, re-write as a new power:

1)  $3^4 \cdot 3^5$

2)  $x^9 \cdot x^5$

Property:  $a^m \cdot a^n =$

3)  $\frac{3^8}{3^2}$

4)  $\frac{x^{12}}{x^7}$

Property:  $\frac{a^m}{a^n} =$

5)  $(3^2)^4$

6)  $(x^4)^6$

Property:  $(a^m)^n =$



**Pizzaz worksheet!**

**Summary:**

Exponents get really \_\_\_\_\_ really  
\_\_\_\_\_. Any number raised to the  
first power is \_\_\_\_\_ and any  
number raised to the zero power is \_\_\_\_\_.

**Out:**

Make up a problem that involves fractions  
and exponents. Solve your own problem.

Attachments

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